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ABSTRACT

Some of the major research on the effects of meaning, frequency, context, and redundancy on word identification in first language reading comprehension is reviewed. The research indicates that the ability to identify words accurately and automatically has a direct effect on comprehension; at the same time comprehension affects word identification. A study is reported that applied the research findings and the methodology and results of previous studies to an investigation of reading comprehension among less advanced and more advanced students of English as a second language (ESL) at Southern Illinois University. Context, frequency, and the subjects' proficiency level were examined in individually administered tests using synonymous word pairs occurring in three levels of sentence context. For this study, the variables of course level, context, and frequency were found to affect word identification. The fact that the advanced students could identify target words with fewer visual cues than the less advanced students was taken to indicate that the ability to use context is a function of increased attained ESL proficiency. The influences of contextual richness and frequency on comprehension were found to be consonant with findings of the studies of first language comprehension on which the present study was based. (AMH)

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THE EFFECTS OF WORD FREQUENCY AND CONTEXTUAL RICHNESS ON ESL STUDENTS' WORD IDENTIFICATION ABILITIES

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There has been considerable research conducted on the effects of meaning, frequency, context, and redundancy on word identification in first language (hereafter L1) reading comprehension. The first part of this paper will review some of the major research that has been presented concerning each of these factors.

In two independent pieces of research, Davis (1944) and Spearritt (1972) have demonstrated the role of word meanings as a component of reading comprehension. Smith and Holmes (1973) equate meaning to uncertainty reduction:

> Meaning is related to the reduction of uncertainty, and must be defined pragmatically with respect to the perceiver. Meaning and comprehension may be regarded as reciprocal terms: meaning as the input to an information-processing decision-making system and comprehension is the output (Smith and Holmes 1973:59).

Pearson and Johnson (1978:15) state that "there is good evidence that persons at all levels of development have more difficulty understanding passages of infrequently used rather than frequently used words." However, there are no data offered supporting this claim. Smith (1971:22) notes that "there is nothing in psychology that is more firmly established experimentally and more keenly disputed theoretically than that people need less visual information to identify more common words." Empirical studies by Howes and Solomon (1951) and Miller, Bruner, and Postman (1954) indicate that lower thresholds are required for the identification of high-frequency words than for low-frequency words. The Miller, Bruner, and Postman study showed that subjects can perceive and memorize nonword sequences of letters such as vernalit more readily than sequences having lower approximations to English phonotactics.

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Context is a widely-researched factor in reading comprehension. It is generally agreed that a meaningful context enhances word identification and reading comprehension. Tulving and Gold (1963) demonstrated that if the context in which a word is contained placed semantic and syntactic constraints upon it, less visual information would be required for that word's identification. Put another way, the more meaning extracted from the context, the lower the visual recognition thresholds, Morton (1964) found that a highly probable context entailed a lower threshold level for word identification. Pierce and Karlin (1957) noted that it took twice as much time to read unrelated sequences of words (word salad) as meaningful material.

Frequency and context are but two components of a much larger determining factor in reading comprehension--redundancy. In language studies redundancy can be defined as the degree to which language is

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predictable when only parts of it are known (Kingston 1977:98). Shannon (1951) was the first researcher to estimate the statistical redundancy of language; he concluded that one word in five could be eliminated from more English texts without serious harm to overall comprehension.

Reading researchers such as Goodman (1973) and Smith (1971) have investigated the effects of sequential redundancy in visual, orthographic, syntactic, and semantic cues in language. There is another kind of redundancy--distributional redundancy. It is a function of the relative number of times each of the alternatives (e.g., letters, words, slots and fillers) that constitute the uncertainty of a particular situation can probably occur (Smith 1971:21).

Cherry (1957) viewed language as a set of constraints which operate at the semantic and syntactic levels of redundancy. The semantic level of redundancy is concerned with the repetition of denotations and connotations of words while the syntactic level of redundancy entails additions to a text. Function words are usually cited as additions to a text because they are not as strictly necessary to convey the message as are content words.

Weaver (reprinted as Kingston, 1977) discussed the effects of a different kind of constraints--what he called horizontal and vertical constraints on reading:

> If a sentence which contains a deleted word (marked by an underline) is presented to a subject who has been instructed to supply the word which he best thinks fits the blank, the response of the subject may seem to be affected by certain characteristics of the sentence itself. For example, the word class of the deleted word, the position of the deleted word within the sentence, or the amount of context preceding or following the deletion appear to function as constraints which partially act to affect the word a subject supplies from his repertoire. These constraints are spoken of ... as horizontal constraints. Just as certain aspects of horizontal constraints operate independently (sequential redundancy, for example), aspects of vertical constraints have been studied most often under the label "association studies" and have been completely divorced from their relationships to natural language. Horizontal and vertical constraints apparently function in "context" reading, for the highly able reader seems to be aware of not only the specific textual setting of a word, but also associates the inputs from previously learned concepts and verbal learnings... Completion of a deleted language unit at a particular point in a sentence is based upon sequential-syntactical relations at that point (the horizontal constraints), upon the associational relationships exhibited by the distribution of words with a privilege of occurring at that point (the vertical constraints), and upon the interaction between the two types of constraints (Kingston 1977:183-184).

Frequency, context, and redundancy directly affect the process of word identification (recognition). Obviously one factor that must be considered in a discussion of word identification in a text is the eye. Jacobson (1951) estimated that the eye can process 4,300,000 bits per second, a bit being defined as the information contained in a binary decision, e.g., a yes or no answer to a question.

Smith (1971) stated that there are two sources of information available forthe identification of words:

> One is featural, the visual information available to the eye, and the other is sequential, our knowledge of the way words are constructed. When there is an overlap between featural and sequential information--when both sources can be used to eliminate some of the same alternative--redundancy exists. And because redundancy exists, the skilled reader can trade off between the two sources--he can make identifications on less featural information because he can make use of his knowledge of sequential constraints (Smith 1971:134).

In another paper, Smith calculated that "constraints in the structure of words make 50% of the visual information redundant, and constraints in the structure of phrases and sentences make 75% of the visual information redundant" (Smith and Holmes 1973:62). It seems to be the case that much of the redundancy in a word is found in its medial and final positions. Broerse and Zwann (1966) found that the initial letters of a word contain more information calcualted in terms of sequential probabilities and consequently contribute more to word identification.

The first half of this paper can be well summarized by the following quote from Pearson and Johnson:

> While the ability to identify words accurately and automatically has a direct effect on comprehension, it must be remembered that comprehension affects word identification.
>
> Factors in the written message affect comprehension. Word frequency...sentence complexity... thematic information,... can all be manipulated to increase or decrease comprehension (Pearson and Johnson 1978:20).

Pearson and Studt (1975) conducted a systematic, empirical study in which they manipulated word frequency and contextual richness to determine their effects on children's word identification ability at different grade levels. They examined the effects of word frequency and contextual richness on word identification. Their subject pool was 36 first-grade and 36 thrid-grade pupils who were asked to guess a word that fit into a blank space in sentences of varying contextual richness. Pearson and Studt found significant main effects for grade level, word frequency, and context and a frequency X context interaction.

In an earlier paper, Perkins and Brutten (1981) reported the results of a study using Pearson and Studt's elicitation sentences on an adult English as a second language (hereafter L2) subject pool. The findings of the Perkins and Brutten study also showed significant main effects for course level frequency, and context among the L2 subjects. This paper is an expansion of the statistical analysis. It also reports some recent findings from the reading research literature particularly on word frequency and contextual richness.

The purpose of the study was to investigate the effects of word frequency and contextual richness on word identification by L2 readers. It was hypothesized that (1) the mean percentage of a word needed for identification by the Course 2 subject pool (described in a later section) would be significantly higher than the percentage needed by the Course 4 subject pool (also described in a later section); (2) the mean percentage of a word needed for identification of high-frequency words would be significantly lower than for low-frequency words; (3) context would have a significant effect; a lower mean percentage would be needed for the identification of rich context words than would be needed for the identification of poor context words. These hypotheses evolved from Pearson and Studt's findings with L1 child subjects.

PROCEDURES

Subjects. This study was conducted at the Center for English as a Second Language (hereafter CESL) at Southern Illinois University. The sample consisted of 36 Course 2 and 36 Course 4 subjects. Each of the Course 2 subjects was matched for sex and nationality with the subjects used for the Course 4 sample. Six languages were represented in each of the groups.

Descriptively, a Course 2 reader is one who reads best when the subject matter is familiar. The reading materials for this level are usually short (under 500 words), and have a limited vocabulary. Students at this level tend to confuse their own thoughts with those of the author and are, therefore, assigned materials that are non-inferential and deal with concrete rather than abstract ideas.

A Course 4 reader is able to read the same general, non-technical materials as a native speaking college freshman. The reading materials for this level of student are about the length of a short story, and incorporate a broader vocabulary as well as context clues. Students at this level can cope with both concrete as well as abstract ideas, and are able to distinguish between their own idea and those of the author.

Materials. The same stimulus materials used by Pearson and Studt were utilized in this study. Pearson and Studt selected the target word pairs from the Thorndike-Lorge (1944) list using three criteria: (a) the members of each pair were reasonably synonymous; (b) within a synonym pair, each member had the same number of letters; (c) each word contained four or more letters. They developed three levels of sentence context for each pair of target words.

1. Rich context was highly definitive and specific.

2. Moderate context was definitive.

3. Poor context level was non-definitive, e.g., any word could fit.

As in the Pearson and Studt study, context levels and frequency levels of the target word across serial position in the 12-item test were balanced. Six test forms were required; each test form had 12 sentences. This is consistent with the procedure used by Pearson and Studt (see Table 1) (1975:92). All subjects received an equal number of items from each context and frequency level. Each test form contained 2 each of the following types: high frequency-poor context; high frequency-moderate context; high frequency-rich context; low frequency-poor context; low frequency-moderate context; low frequency-rich context.

Procedure. Each subject was tested individually. Subjects were told that they were going to be asked to word-guess. They were given one example as practice. The experimenter read each sentence aloud. If the subject guessed incorrectly, the experimenter supplied the first letter of the word, and the subject was asked to guess again. This procedure of supplying letters continued until the correct word was identified or until all letters in the word had been provided by the examiner.

Analysis. An analysis of variance by ranks was used to evaluate the percentage of the total word needed to achieve identification recognition. The criterion level of significance was .05.

Results and Discussion. Before any analyses were conducted, the researchers determined that the six different tests were equal in difficulty. The Kruskel-Wallis one-way analysis of variance by ranks indicated the absence of a statistically significant difference among the tests used.

The mean percentage of a word needed by the Course 2 and Course 4 subjects to achieve identification for frequency and context levels is reported in Table 2.

Cutting across frequency and context levels, the mean percentage required by the Course 2 subjects for identification was 70.03%; and for the Course 4 subjects, it was 63.09%. This difference was significant at the .01 level, $F(1.862)=8.14$. The mean for all high frequency words across course context levels was t1.88%. For low frequency words, it was 81.52%. The difference between these means was significant at the .01 level, $F(1,862)=216.75$. The mean percentage for identification of poor context words across course for high and low frequency levels was 76.67%; for moderate context words, 64.11%; for rich context words, 59.24%. There was a significant difference at the .01 level between the three means when considered together, $F(2,861)=23.29$.

In order to determine if these findings were consistent for the L2 subjects coming from different language groups, a post hoc analysis was made to see if: (1) there were significant differences in the mean percentages of a word needed for identification by the various language groups represented in the subject pool, and (2) if

cutting across the language groups there is significantly higher mean percentages for poor contexts than for moderate and rich contexts. These hypotheses evolved from the fact that each language group would have had different amounts of exposure to English, amounts and types of training, and different amounts of interlanguage interference.

For these analyses non-parametric statistical tests were used because little could be assumed about the distribution. The Kruskal-Wallis one-way analysis of variance by ranks was used to determine whether k independent samples were from different populations, and the Friedman two-way analysis of variance by ranks was used to test the null hypothesis that the k samples were drawn from the same population.

Tables 3 and 4 display the cell means for the Course 2 language groups. There are no significant test statistics in Table 3. Evidently the low frequency words were so novel for subjects from all language groups that all subjects needed a large proportion of the word supplied for identification. There was no significant difference in the percentage of word needed for the different language groups. Cutting across language groups, no difference was found among the three contexts.

As Table 4 shows, there are two significant test statistics. First, H=12.09 under the poor context column indicates that there was a significant difference in the percentage of word needed for indication by the different language groups overall; the Kruskal-Wallis does not indicate where the difference is--just that there is a difference overall. Second, for the Arabic group, the Friedman Xr^2 statistic was significant indicating that there was a significant difference between the percentage of word needed for identification by the Course 2 Arabs in all three of the different contexts. Again, the Friedman does not indicate where the difference is and the subject size is so small that neither the sign test nor the Wilcoxon matched-pairs signed-ranks test for related samples can be used to determine where the differences are between pairs of contexts.

Table 5, Course 4-Low Frequency words, indicates no significant Kruskal-Wallis statistics for differences between language groups within any context and only one significant Friedman statistic, that for the Thai group. There was a significant overall difference between percentage of word needed for identification for the different contexts by the Thai sample but the Thai sample is so small that no test for related samples can be used to determine which pairs of contexts yield the significant differences.

Table 6, Course 4-High Frequency Words, shows no significant differences between the language groups within any context level. However, there were significant differences for the Arabic, Japanese, Malaysian, and Spanish groups between contexts. For each group mentioned, there were significant differences between percentage of word needed for identification for the three contexts overall. The Arabic and Japanese groups were too small to use the sign test to determine the contexts that produced the significant differences. In the Malaysian group, the sign test indicated a significant difference between the rich and poor contexts, N=5, X=0, $P < .031$. No significant differences were noted between the rich and moderate contexts nor between the moderate and poor contexts.

For the Spanish group there was a significant difference between the poor and rich contexts, N=21, X=2, $p < .001$; the moderate and rich contexts, N=20, X=5, $p < .021$; and the poor and moderate contexts, N=20, X=2, $p < .001$.

The difference revealed for the Thai subjects appears to be spurious because they did better in the moderate context than in the rich context.

Additional post hoc analyses were conducted to evaluate the interaction of class level (Course 2 and 4), context, and frequency (see Figure 1 and 2). Tables 7 through 9 display the three ANOVA analyses for different dependent variables. Since no non-parametric procedure exists that will evaluate interaction, it was necessary to use the ANOVA. Fortunately, the ANOVA is a robust parametric statistical procedure. Unless the distribution is considerably different from normal, no serious effect should be evident.

Table 7 contains the analysis of the percent of word needed for identification in poor context as the dependent variable, with class level as the independent variable, and with percent of word needed for identification of high frequency words as the covariate. Both obtained significant F ratios.

In Table 8, percent of word needed for identification in moderate context is the dependent variable with class level as the independent variable, and with percent of work needed for identification of high frequency words as the covarate. Class level accounts for more variance inthe dependent variable ($F=7.699$, $p < .007$) than high frequency, the covariate ($F=.463$, $p < .498$).

In Table 9, the covariate, percent of word needed for identification of high frequency words, accounts for more variance in the dependent variable, rich context, than does the independent variable. Tables 7 through 9 corroborate the previously noted determining effects of frequency and class level on word identification.

Table 10 displays a regression analysis of percent of words needed for identification of high frequency words and low frequency words as dependent variables with percent of word needed for identification of words in rich, moderate and poor contexts as predictor variables. For the high frequency dependent variable, rich context accounts for 50% of the shared variance; moderate context accounts for an additional 17-18%, and poor context contributes 5% of accounted variance.

As has been mentioned previously, the low frequency words exhibited depressed variance, the subjects required a high percentage of the word to be supplied. Rich context accounts for 23% of the shared variance (contrasted with 50% for the high frequency variable); poor context accounts for more variance than moderate, 12% versus 4%. In sum, the contexts are not as robust predictors for low frequency as they are for high frequency.

The robustness of high frequency and rich context having been demonstrated, the researchers conducted one final post hoc analysis

on the moderate and poor context variables. A Wilks' Lambda discriminant analysis of the frequency and contexts indicated that a combination of the two context levels could correctly classify from 63.89% to 69.44% of class level cases. Low frequency could correctly predict 61.11% of class level cases.

Three factors--context, frequency and proficiency level--have been examined to ascertain what effect they have on word identification by adult L2 subjects. But greater issues in reading are related to this study. It is now generally agreed that readers attend to various types of linguistic structures as they read: letters, grapheme-phoneme correspondences, word parts, spelling patterns, syllables, morphemes, words, phrases, clauses, sentences, and text (cf. Wanat, 1977a and b). Controversy surrounds the notion that mature readers process words letter-by-letter as they read. Goodman (1976) has proposed that mature readers process sentences and text too quickly to permit the processing of individual letters. On the other hand, Gough (1976) has argued that fluent reading is the letter-by-letter process.

What can be found in the research literature to explain the findings presented here? Readers utilize the inherent redundancy in language by picking up clues from the morphological, syntactic, and semantic systems of language. Proficient reading may involve precise, linear, sequential activity but also the process of selecting from redundant clues to meaning which are found in a text (cf. Goodman, 1967, 1970, 1973; Smith 1971, 1973; Wanat 1977a,b).

Following Goodman's model of reading, Yorio (1971:108) suggests that L2 reading is different from L1 reading for the following reasons: (1) the reader's knowledge of the foreign language is not like that of the native speaker; (2) the guessing or predicting ability necessary to pick up the correct cues is hindered by the imperfect knowledge of the language; (3) the wrong choice of cues or the uncertainty of the choice makes associations more difficult; (4) due to unfamiliarity with the material and the lack of training, the memory span in a foreign language in the early stages of its acquisition is usually shorter than in our native language; (5) at all levels, and at all times there is interference of the native language.

There is also great variability within and between readers from the same language and/or different languages. Griffin (1978) has suggested yet another sort of variability

> Readers will vary in how they select and use information made available by the language. Reading strategies will vary in two ways: first, one reader may use different strategies in different passages; second, different readers may rely more on strategies from one part of the language system than another in getting clues to meaning (Griffin 1978:58).

In sum, for this study all three variables--course level, context, and frequency--affect word identification. Factors cited in the preceding discussion may also have had a determining effect. However, the fact that Course 4 subjects could identify the target words,

particularly those of high frequency-rich and moderate contexts, with fewer visual cues than Course 2 subjects indicates that the ability to use context is a function of increased attained ESL proficiency. The influences of contextual richness and frequency noted in this study are consonant with the findings of the L1 studies. The low frequency words were so novel for the L2 subjects that the variability was depressed for all language groups. For the high frequency words, variation in L2 competence, previous training and the effects of various bilateral and unilateral constraints produced different effects among language groups.

TABLE I
Materials

Word Pairs	Context Level	Sentences
HF battle	P	The men just returned from _____.
LF combat	M	The men just marched back from _____.
	R	The soldiers just marched back from the bloody _____.
HF change	P	The children decided to _____ sides.
LF switch	M	Father had to _____ the tire before we left on our trip.
	R	The football teams _____ sides at half time.
HR hurry	P	I will ride there in a _____.
LF jiffy	M	In order to make the flight, we had to drive to the airport in a _____.
	R	If we run we'll get there in a _____.
HF break	P	Did you _____ my candy cane?
LF crack	M	Which leg did you _____?
	R	Will you _____ the candy cane in two for us?
HF dirty	P	After being outside, many children got _____.
LF muddy	M	Children who play outside often get _____ clothes.
	R	Come in immediately and wash those _____ hands of yours.
HF dangers	P	This story tells of the _____ of the water.
LF hazards	M	One of the _____ of driving is having a blowout.
	R	The sign warned us of the _____ of skating on thin ice.
HF build	P	The men came to work to _____ the school.
LF erect	M	The workers started to _____ the school.
	R	The birds gathered materials and began to _____ their nest.
HF song	P	In school today we voted for our favorite _____.
LF tune	M	The choir got to choose its own _____.
	R	In music class we chose to sing a happy _____.
HF pain	P	Mother complained about her _____.
LF ache	M	Do you still have the _____ in your head?
	R	Mother took a pill for the _____ in her broken finger.
HF talk	P	John, take time to _____ with us.
LF chat	M	Let's sit down and _____ over that question.
	R	John wants to _____ with you on the phone.
HF look	P	Will you help me _____ now?
LF peek	M	Will you quietly _____ in and see how the baby is?
	R	John come over and _____ at what I've got.
HF stop	P	We decided to _____ for a while.
LF halt	M	The men were ordered to _____.
	R	You had better decide to _____ for that red light.

HF = high frequency
LF = low frequency

P = poor context
M = moderate context
R = rich context

TABLE 2
Cell Means: Percentage of Word Needed for Identification

	High Frequency			Low Frequency			
Subjects	Rich Context	Moderate Context	Poor Context	Rich Context	Moderate Context	Poor Context	
Course 2	42.39	54.54	66.73	82.33	83.97	89.90	x=70.03
Course 4	35.94	42.14	69.95	76.66	75.45	80.83	x=63.09
	Overall x=51.88			Overall x=81.52			

TABLE 3
Cell Means: Percentage of Word Needed for Identification
Course 2 - Low Frequency Words

Language Group	Rich	Moderate	Poor	Xr^2
Arabic	83.25	93.75	100.00	0.75
Japanese	87.50	87.50	85.12	1.60
Malaysian	77.50	61.25	84.25	-5.79
Spanish	83.45	86.47	90.50	-2.79
Thai	83.75	78.50	100.00	3.00
Turkish	62.50	100.00	90.00	
H	-5.20	-2.44	4.38	

TABLE 4
Cell Means: Percentage of Word Needed for Identification
Course 2 - High Frequency Words

Language Group	Rich	Moderate	Poor	Xr^2
Arabic	12.25	22.25	82.25	4.00*
Japanese	39.27	44.75	73.62	2.00
Malaysian	36.41	53.66	75.50	6.08
Spanish	45.45	60.97	63.26	5.21
Thai	58.50	33.75	31.00	3.25
Turkish	41.5	70.00	100.00	
H	2.91	8.92	12.09*	

*p .05

TABLE 5
Cell Means: Percentage of Word Needed for Identification
Course 4 - Low Frequency Words

Language Group	Rich	Moderate	Poor	Xr^2
Arabic	86.16	83.33	95.83	2.6
Japanese	66.75	83.37	72.87	0.5
Malaysian	61.70	58.70	63.40	0.3
Spanish	78.50	78.24	83.64	0.738
Thai	95.00	67.50	100.00	25.75**
Turkish	87.50	62.50	57.50	
H	6.95	5.46	7.25	

**p .01

TABLE 6
Cell Means: Percentage of Words
Needed for Identification
Course 4 - High Frequency Words

Language Group	Rich	Moderate	Poor	Xr^2
Arabic	24.16	37.66	75.50	6.00*
Japanese	33.12	16.87	69.75	6.125*
Malaysian	35.30	57.40	73.80	6.40*
Spanish	37.57	43.40	70.85	19.30**
Thai	58.25	65.00	59.75	1.00
Turkish	7.00	10.00	41.50	
H	-4.06	10.85	4.46	

*p < .05
**p < .01

TABLE 7
Main Effects
Poor Context by Class Level with High Frequency

Source of Variation	Sum of Squares	DF	Mean Square	F	Significance of F
Covariates					
High Frequency	7092.285	1	7092.285	63.832	.000
Main Effects					
Class Level	1022.617	1	1022.617	9.204	.003
Explained	9087.301	2	4543.648	40.894	.000
Residual	7666.484	69	111.108		
Total	16753.785	71	235.969		

TABLE 8
Main Effects
Moderate Context by Class Level with High Frequency

Source of Variation	Sum of Squares	DF	Mean Square	F	Significance of F
Covariates					
High Frequency	59.101	1	59.101	0.463	.498
Main Effects					
Class Level	982.187	1	982.187	7.699	.007
Explained	1135.059	2	567.529	4.448	.015
Residual	8802.863	69	127.578		
Total	9937.922	71	139.971		

TABLE 9
Main Effects
Rich Context by Class Level with High Frequency

Source of Variation	Sum of Squares	DF	Mean Square	F	Significance of F
Covariates					
High Frequency	10339.473	1	10339.473	66.737	.000
Main Effects					
Class Level	97.126	1	97.126	.627	.431
Explained	10957.816	2	5478.906	35.364	.000
Residual	10690.074	69	154.929		
Total	21647.891	71	304.900		

TABLE 10
Multiple Regression Analysis of Frequency and Context

	Multiple R	RSQ	F(EQU)	SIG F	RSQCH	FCH	SIGCH
High Frequency - Dependent Variable							
Rich Context	.70	.50	70.477	.000	.50	70.477	.000
Moderate Context	.82	.68	73.758	.000	.17	38.89	.000
Poor Context	.85	.73	61.91	.000	.05	12.86	.001
Low Frequency - Dependent Variable							
Rich Context	.48	.23	21.37	.000	.23	21.37	.000
Poor Context	.60	.36	19.51	.000	.12	13.75	.000
Moderate Context	.63	.40	15.214	.000	.04	4.589	.036

FIGURE 1. Mean percentage of word needed for identification for the frequency X Course Level

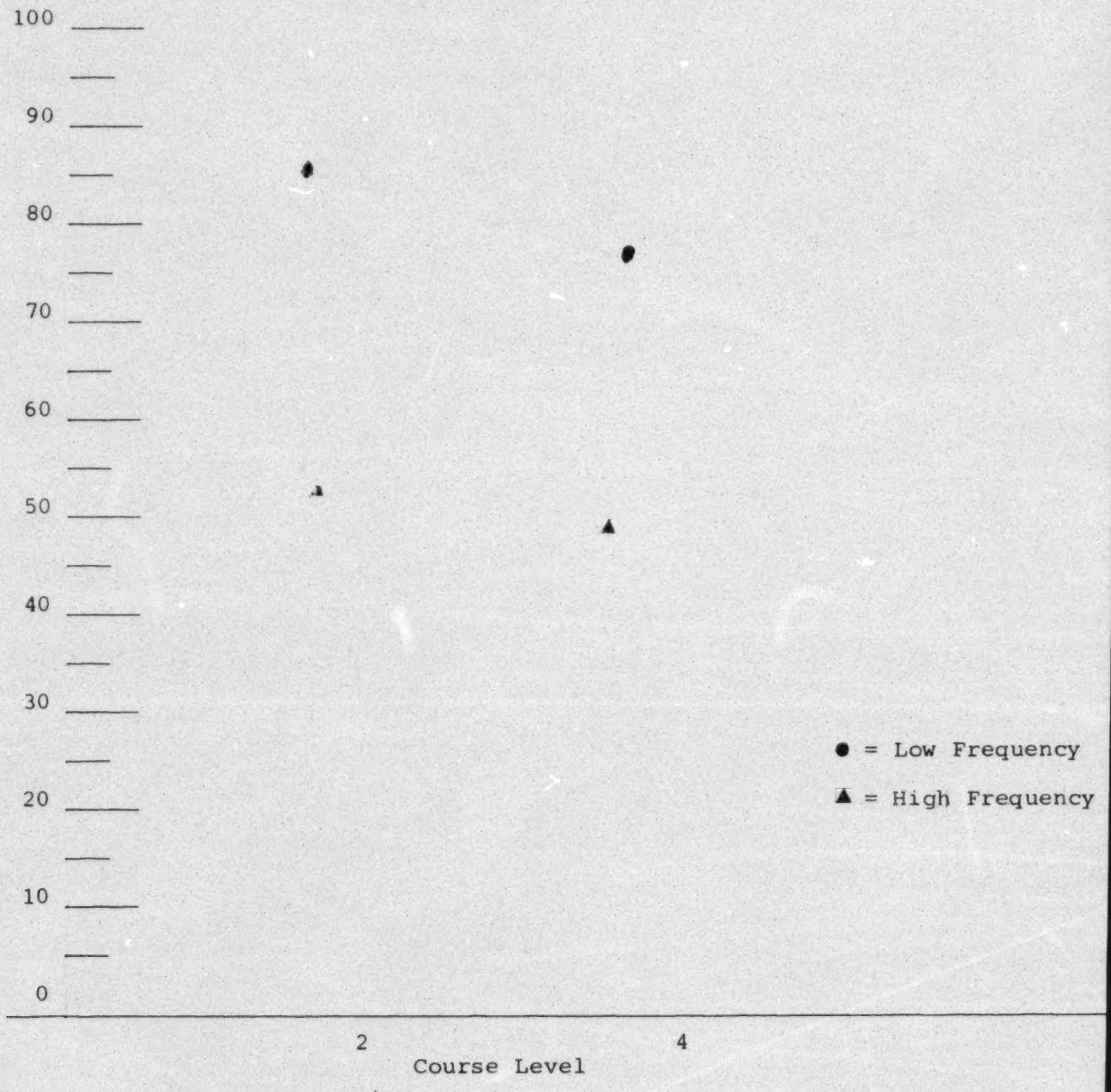
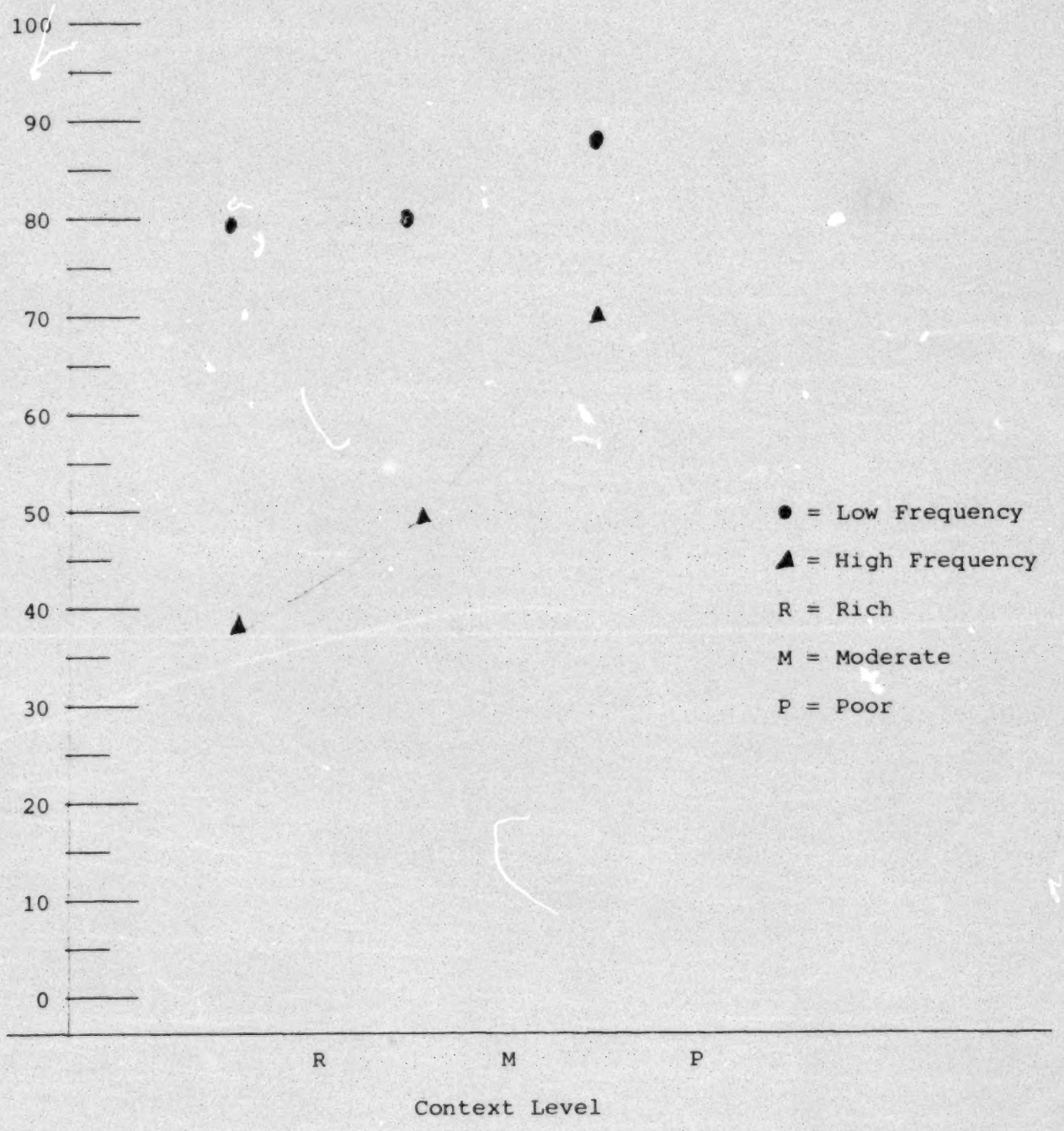


FIGURE 2. Mean percentage of word needed for identification for the frequency X context interaction



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